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Marketing Information for Minnesota Dairy Farmers

Component Pricing of Producer Milk

THE ISSUE

Buyers of milk from dairy farmers in most parts of the United States currently base variations in prices paid on fat content only. A base price is established for milk of 3.5 percent milkfat, with price adjusted up or down depending on the butterfat test. The procedure results in a constant price for the other major components of milk—the solids not fat (snf). If the snf do not vary, or if the variations are in constant proportion to the fat variations, the present pricing procedure could be used to reflect value differences of both fat and snf. But snf do vary substantially among herds, and the variation is not usually in constant proportion to the fat.

There is increasing interest in milk pricing methods that consider both snf and fat variation. This interest has developed for several reasons. First, snf components of milk have become more valuable compared to milkfat. Between 1960 and 1977 the proportion of the farm value of a hundredweight of milk accounted for by snf rose from about 37 to 56 percent. Second, practical and low-cost methods of testing for snf have been developed. Third, some recent experience with snf pricing indicates that it is a practical way of pricing milk and that it more accurately represents the value of producer milk deliveries. The dairy industry in California has been using an snf pricing program since 1962. Two Vermont cooperatives have recently begun protein pricing. Wisconsin is developing guidelines for payment of milk according to snf.

The outlook for an snf pricing program in Minnesota is uncertain. A Minnesota district court in July 1978 issued a restraining order to prevent buyers from fixing producer milk prices according to protein content in addition to the milkfat adjustments. An Iowa cooperative, Mississippi Valley Milk Producers Association, purchased some milk from producers in Minnesota and had been paying its members a protein premium. After receiving complaints from other cooperatives in Minnesota, the court decided that the procedure was illegal because milk payment regulations do not explicitly allow for payment on this basis. However, as protein pricing is more widely adopted in other states, Minnesota milk processors may be forced to develop a plan for component pricing. The Minnesota Department of Agriculture recently held hearings on procedures for nonfat pricing.

HOW WOULD SNF PRICING CHANGE PAYMENT FOR MILK?

Since the 1940's, most milk producers have been paid for milk on the Froker-Hardin payment plan.[1] With this plan, a base price is set for milk of 3.5 percent milkfat, for example, $9 per hundredweight. A differential is fixed for each point (one tenth of a percent) that the butterfat test differs from that level. The differential is usually based on the value of that quantity of milkfat in the production of butter—currently about 14 cents. The Froker-Hardin plan, as originally developed, was based on the tendency that a fat test variation of 0.1 of one point was accompanied by an snf variation in the same direction of 0.04 of 1 percent. Their proposed price differential included both the value of this average fat and snf variation. However, there are a couple of major problems with the plan. First, most fat differentials for producers include only the value of the milkfat variations. The federal order differentials include only butter prices in the computation of milk price differentials.

Second, milk differs substantially from herd to herd in its snf components, and variations are not always related to milkfat in a 0.04 to 0.1 relationship. A Pennsylvania study of 136 DHIA herds showed protein to vary from 3.03 to 4.23 with an average of 3.30 percent of the whole milk. Data collected biweekly in Minnesota in the 1960's for 80 herds showed the following averages and ranges of total solids-not-fat, protein, and casein.

	Average (percent)	Range (percent)
Total solids-not-fat	8.75	7.95-9.71
Protein	3.40	2.50-4.83
Casein	2.59	1.90-3.85

The original data showed snf generally increased with fat test levels, although the relationship was not stable. For example, for one of the herds with a measured fat test of 3.1 at four different times during the year, the snf tests were 8.16, 8.24, 8.34, and 8.55.

Component pricing procedures tied to snf tests vary in terms of the snf component used for pricing. California has a total snf program.. Other programs have tied pricing to protein; some programs have paid differentials for protein only. Because cheese yields are significantly influenced by casein content, it may be argued that casein content should be the basis of nonfat component pricing.

To illustrate how a component pricing program would work and its impact on prices received by individual dairymeh, consider three hypothetical but typical producers delivering milk to a plant. All deliver milk testing 3.5 percent milkfat, but total snf are 8.50, 8.75, and 9.00 percent, respectively. They deliver to a plant which pays $9 per hundredweight base price for milk of 3.5 percent milkfat. So, each producer receives precisely the same price per hundredweight with no snf price differential. Now, assume that the plant also pays a 6-cent differential per point (0.1 percent) of snf that milk varies from 8.75 percent snf. So, the producer pay price would be as follows:

Producer A: $9 - (2.5) ($.06) = $8.85 per hundredweight
Producer B: $9 + 0 adjustment = $9.00 per hundredweight
Producer C: $9 + (2.5) ($.06) = $9.15 per hundredweight

Producer prices, therefore, vary 30 cents per hundredweight even though fat content of milk deliveries are identical.

WHY PRICE MILK ACCORDING TO SNF CONTENT?

The main reason for using pricing methods that adjust for nonfat solids in milk as well as fat is that it is more equitable—more equitable between producers, between processors, and between producers and processors. To illustrate consider the snf variation with the previous example with August 1978 milk and milk product prices. In August 1978, the average Minnesota-Wisconsin price for milk of 3.5 percent milkfat was $9.68 per hundredweight with a 12.1-cent butterfat differential. This means that producers received $4.24 for the fat in 100 pounds of milk of 3.5 test and $5.44 for the snf regardless of snf content. Milk product prices for August 1978 were $.71 per pound for nonfat dry milk and $1.16 per pound for butter. For these prices, what is the value difference to a butter-powder plant for milk from three different producers with snf at 8.50, 8.75, and 9.00 percent snf, respectively, and milkfat at 3.5 percent for all. The value of the butter per hundredweight of milk from each producer is precisely the same. However, the values of the nonfat dry milk powder with 2 percent moisture and 100 percent snf recovery are $6.15, $6.34, and $6.52 per hundredweight of whole milk, a 37 cent variation. Each 0.1 percent increase in snf is worth approximately $.072. The value of different snf in cheddar cheese is harder to determine; however, the higher the casein content of milk, the higher the cheese yield. The value differences are at least as great as indicated for use in butter and dry milk.

Obviously, the value differences between milk of different snf content are significant, yet they are not widely recognized in milk pricing. If it is equitable to pay for fat in milk according to the amount present in the milk, it seems reasonable to pay for the other major components, according to the amount present.

ARGUMENTS AGAINST COMPONENT PRICING

A number of objections to component pricing have been raised. It is argued that testing for snf is not yet accurate enough to provide a reliable measure of snf content. There are currently several methods of testing. The University of Minnesota is now studying the accuracy of testing methods. Study results should provide an answer on the accuracy question. Nevertheless, where snf pricing is now used, testing reliability is not a major issue.

It has been argued that there is no way for processors and distributors of fluid products to recover the extra costs they would incur if they received milk with higher than average snf content for their market. Standardizing the snf content of milk downward with current technology would be difficult without adding water. California has solved this problem by increasing the minimum legal snf content of fluid milk products. The result is that almost all fluid milk products must be standardized by adding solids. This means that the higher the snf content of producer milk, the less the snf that needs to be added, and the greater the milk value to the processor.

It is argued that testing for snf is an added cost ultimately paid by the farmer. It is likely that the additional cost is borne by both the dairyfarmer and the consumer. However, two other considerations may offset this cost. Testing and tying prices received for milk to snf and fat content provide another piece of management information to the farmer decisionmaker. The cost of testing may be offset by more efficient production. Second, if the program results in higher snf in fluid milk products, it is possible that demand for fluid milk products may be increased. California, in fact, has tied its milk promotion programs to the higher snf content. And in 1977, consumption of both low fat fluid products and fluid whole milk exceeded the U.S. average.

OTHER IMPACTS OF COMPONENT PRICING

There are several other questions often raised regarding component pricing:

1. How will snf component pricing affect the way milk is produced? It's been argued that dairy herds, other than Holstein, would then yield greater returns to milk production. This may or may not be true. It's a complicated issue, but fat differential pricing did not cause a shift to Guernseys and Jerseys even though they produce higher butterfat milk. The crucial issue was the total amount of butterfat produced per lactation, not the percentage butterfat. A similar consideration will determine response to snf pricing.
2. How will snf pricing affect competition among milk plants for milk supplies? Initial impacts will depend on whether this pricing scheme is adopted by individual firms or whether the scheme is mandated by law for all plants. If industry initiated, it is argued that producers with low snf will shift to plants that buy according to only a fat differential and producers with high snf will shift to plants paying according to snf. The argument fails to consider that each plant's ability to pay for milk depends on the snf content of all producer milk, which determines product yields per hundredweight of producer milk. Competition among plants for milk supplies may be altered, but it is not altogether clear how.
3. What will the impact be on consumers? Here also the answer is probably very little. For manufactured dairy products, prices should not be altered. If there is any change, it should be for the fluid milk products. As indicated, snf pricing would probably mean required snf standardization. If snf standardization becomes a normal procedure for fluid products, the process would probably cause somewhat higher consumer prices for fluid products. This would depress the volume of milk to fluid uses, but it is possible that the snf quantity would be maintained. Yet, it could require more milk to produce a unit of the standardized product.

These are some of the important issues in snf pricing to producers. Further analysis is called for and some questions may only be answered if the pricing procedure is adopted. Regardless of these impacts, however, the procedure has the potential to more equitably pay producers for milk and to more accurately reflect supplies and demands for the various milk constituents.

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